

## Summary from the ad-hoc working group on computing

### **Background**

The ATLAS computing environment has changed with respect to the situation three years ago. At that time we had a rather small computing environment working essentially in isolation from the rest of the collaboration, and a much larger community working with old generation software addressing issues relevant to detector design and physics potential while often sceptical about new software approaches. Today there are broad new software activities in all detector systems, an architecture team providing a central framework and an international network preparing the global computing infrastructure and executing data challenges. In addition we have many off-project links to maintain, notably to the grid activities. However, this does not mean that everything works well, indeed there are signs, e.g. from the 2002 overview day, that organizational readjustments are needed. These next steps should be taken into account when ATLAS searches a new computing coordinator following the promotion of Norman McCubbin at RAL.

When searching for the new computing coordinator, it is important to understand roughly the ATLAS computing needs of today in terms of coordination and leadership. An ad-hoc working group was created to sound out this in the community. The working group was

- T. Wenaus (ATLAS planning officer and LCG application software manager)
- D. Quarrie (chief architect)
- J. Collot (LAr sw coordinator and previous release coordinator)
- M. Wielers (put forward by the physics coordinator to give end-user view)
- R. Jones (world wide computing, and remote software installations)
- S. George (online computing aspects)
- T. Åkesson (deputy spokesperson)

The members in this working group talked to as many people as they could during the software week 16-20 September and summarized their findings (including their own opinions). In addition the system software coordinators, the data challenges coordinator, the coordinators for database, simulation and reconstruction, the NCB chair, and the responsible for quality control were explicitly asked to send feedback. The working group has approached an order of magnitude of 50 colleagues.

This is the working group synthesis of the extensive feedback. It will hopefully help the search committee to find a suitable leadership for ATLAS computing.

### **General comments**

There are a number of universal (or almost universal) recurrent themes voiced by the community:

#### **Type of changes needed**

ATLAS needs an evolution and not a revolution. We interpret this as a wish to maintain the system software organizations, but strengthen the leadership across systems.

#### **Global view**

There should be a clear global view from the data to the physics analysis. This is necessary for collaborators to understand where they fit in. It is of highest priority for the overall computing coordination to supply this vision.

#### **Software coordination**

More software coordination is needed in both quantity and depth. This should be done by a fully dedicated collaborator with deep competence and authority, leading to timely decisions based on technical grounds. This should be introduced consistently with existing positions: Chief architect, software controller and release coordinator.

## **Activities outside ATLAS software**

Many new activities have been added to computing during the last years. World wide computing, running data challenges and production logistics, resource management, grid, liaison to other projects (LCG), project office issues (scheduling, reviews, tools). These aspects require more attention.

## **Personal responsibility and authority**

Computing needs strong leaders and not coordinators without authority. The functions should therefore be renamed to leaders, e.g. computing project leader, software project leader, etc. The last word on decisions lay with the leaders in charge, and should be backed from above (ATLAS management, EB and CB).

## **CSG**

Steering groups should not dilute authority of decision-making, but rather be advisory to the relevant leader. The CSG is too large and inefficient. It would be better if the computing is split into activity lines, each with its own steering group chaired by the relevant activity leader, and with the computing coordinator with the activity leaders forming a management team.

## **Decisions**

Timely decisions should be taken by the people in charge, and not be delayed by lengthy consensus seeking. The decision authority should be at the relevant level where it can be done with the needed competence, and not escalated to the highest level where in-depth technical considerations will not be addressed.

## **Projectization**

More effort should be invested into defining computing as a project with unambiguous responsibility areas. This would help in developing a common vision, make follow-up clear, distribute responsibilities and engage new people. A clear WBS is an organizational tool to present the project, and a resource-loaded plan a tool to get realistic time estimates.

## **Infrastructure**

Computing needs a dedicated infrastructure team handling releases, library, tools etc. The collaboration and host-laboratory must supply the needed human resources. These tasks should not be rotated among people with other duties.

## **Service to end-users and new-comers**

The computing coordination has to ensure that sufficient effort is invested into providing a service. Also proactive measures should be taken in this respect (offering support for testbeam for example). The collaboration and host-laboratory must supply the needed human resources. The computing should take initiative to dedicated one-to-one meetings with the systems.

## **Online**

The connection between online and offline must be strengthened. The global view, to be developed by the computing coordination, should include online. Online should also have a prominent place at the software workshops. One further strengthening would be to merge the HLT-software and reconstruction leadership.

## **Resources and authority**

The feedback in the previous section calls for some changes and improvements. This cannot happen by just making requirements on the computing coordinator. Their solutions require resources, and can only be supplied by the collaboration and the host laboratory. There is an asymmetry between the human resources put at the disposal of the technical coordinator and the ones for the computing coordinator, even if the magnitudes of the scopes are not very different.

The new computing coordinator should outline a global plan and improved organization, and specify its required resources. It is then up to the collaboration and host laboratory to supply these resources.

Authority is built by: Competence in the area of responsibility, personality, empowerment, backing from ATLAS management, EB and CB, and control of resources. The latter point is difficult to satisfy in a global collaboration like ATLAS, but would be helped if the coordinator had line control of some human resources as technical

support. The backing requires awareness by the corresponding bodies. Empowerment requires an agreement between the coordinator and the community of what the coordinator is expected to deliver.

## ***The search for a computing coordinator***

It would not be right at this stage to define what the top-level computing organization will look like under the new leader. The new computing coordinator should be made aware of required improvements, and work out her set-up to handle it. The new computing coordinator will get access to the material from this ad-hoc committee to help the process.

However, there is one aspect that has to be considered already at the stage of the search committee: It is unlikely that one person can both do the increased software coordination and the full task of managing all other computing project aspects. One problem in ATLAS computing is diluted responsibilities, and this is certainly visible in the roles of the chief architect with respect to software coordination. This situation will not improve if the chief architect remains, and we get a new computing coordinator with main focus on personally coordinating the software. Therefore ATLAS needs an overall computing coordinator responsible for the complete project, and a dedicated software coordinator who is probably also the chief architect. The optimal competences for these two are not the same.

## **The computing coordinator**

A physicist with leadership and management skills, fully responsible for the complete computing project, and focused on leading it in all its aspect, with a long-term vision w.r.t. collaboration needs. Should delegate work to the relevant activity leaders, e.g. the software leader, without micromanaging their areas of responsibility. Should ensure that the full project is covered, and progresses on a broad front. Should have a high bandwidth informal communication with the collaboration at large, and with the people working directly in computing. Be focused on that the computing should serve the collaboration as a whole. Resident, or almost resident, at CERN.

## **The software project leader (reporting to the computing coordinator)**

A deep competence in modern software, understanding and experience of high-energy physics specific software and requirements. Should have a broad software view, i.e. should pursue integration and consistency of all software: core-reconstruction-simulation - online ... . He reports to the computing coordinator and is probably also the chief architect. Resident, or almost resident, at CERN.

## **Information to the collaboration board**

The collaboration expects with the appointment to understand how the software will be coordinated. Since a responsible set-up would require that the computing coordinator delegates the software coordination to an activity leader with authority, it would be reasonable to ask the proposed computing coordinator candidate to explain in his statement to the CB how he intend to implement this.

## ***Questions to ask a computing coordinator candidate***

- What should ATLAS computing look like in 2007?
- What do you think are the main priorities for ATLAS computing?
- How would you like the top-level computing organization to operate?
- Which service should the top-level computing coordination supply to the users and the systems?
- Which is the technically most critical issue for ATLAS computing?
- Which main areas should be covered by the computing coordination, and which are the dependencies between them?
- If you were the computing coordinator, what would you do during the first three months?
- How would you improve the consistency between offline and online?
- Can you have a large presence at CERN?
- How would the software coordination be done if you are computing coordinator?
- What would be your approach and time-scale to fully integrate ATHENA and G4 as the ATLAS software backbone?